Technology is Key to Establishing a Competitive Advantage

Leo Schrider
Chair, Petroleum Technology Transfer Council, and
Senior Vice President, Belden & Blake Corp.,
N. Canton, Ohio

Abstract

In the recent oil price crisis, independent oil and natural gas producers have struggled to keep their wells producing. Low crude oil prices forced many wells to be shut in or abandoned, unless ways were found to reduce costs and improve production efficiency. For many operators, technology can be applied to successfully achieve these desired results. In addition, technology can be key to obtaining critical exploration and development information — now even through the Internet or by using new software tools and computer-related information.

Today, it's essential for independents to gain — and maintain — a competitive advantage in the marketplace. There are two basic ways to establish a competitive advantage — do things better than others or do things differently.

At Belden & Blake, an independent based in the Northeast, technology is very important to the company's success. For example, in Michigan, the company recently was recognized by the Gas Research Institute (GRI) for its success in promoting market adoption of new natural gas technology. By applying advanced technologies and integrating research on improved reservoir characterization, Belden & Blake was able to remain active in its Antrim shale development — even without a tax credit that expired in 1992. The incremental revenue to the company from applying this new technology has been substantial.

Belden & Blake has successfully implemented many other new technologies, some which are directly related to the Department of Energy's research programs. In one instance, the company used carbon dioxide methods, which DOE helped develop, to restore a well's productivity from nearly zero to 500 thousand cubic feet of gas per day. It also has found success with other programs, such as those related to tight gas sands and coal bed methane. In fact, nearly 80 percent of Belden & Blake's drilling today would fall under the category of "unconventional" that was used back in the 1970s when these resources were first identified as having the potential for future drilling and replacement of produced resources.

Other sources of new technologies can be found through organizations such as the Petroleum Technology Transfer Council (PTTC). The non-profit national association acts as a "technology connection" in helping transfer technological information to U.S. independent producers. PTTC's low-cost technology programs can help producers reduce costs, improve operating efficiency, increase ultimate recovery, add new oil and gas reserves, and comply with environmental requirements.

Ultimately, informed decisions can be developed and implemented for most E&P programs. Technology remains the key to determining the correct course of action, whether independents gain a competitive advantage by doing things better — or doing things differently. Resources like those offered by DOE, PTTC, GRI, and others can help independents identify the best technology options for their particular needs. By using new tools and technologies, independents can expand their knowledge base and gain a competitive advantage. Most importantly, they can weather the storm and survive the next downturn during times of low oil and natural gas prices.

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Leo A. Schrider

Senior Vice President, Belden & Blake Corp.

North Canton, Ohio

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Establishing Competitive Advantage

There Are Only Two Basic Ways

to Establish Competitive Advantage

- Do things better than others
- Do things differently

-- Karl Albrecht, futurist

Belden & Blake - From McKinley to Clinton

Late 1890s (McKinley is President)

- Belden Brick use coal to fire its kilns for manufacturing bricks

During 1930s (Roosevelt is President)

- Belden explores using natural gas in its kilns

Late 1940s (Truman is President)

- Belden uses hydraulic fracturing in Ohio gas/oil pools

- Clinton fields are opened - To date, over 20,000 wells have been drilled, accumulating over 100 million barrels of oil and 4 Tcf of gas

Belden & Blake - From McKinley to Clinton

Early 1970s (Nixon is President)

Project Independence announced and DOE formed

- Synfuels and Unconventional Gas Recovery programs begin
- Tax credit allowed to develop gas from unconventional sources

1980s (Reagan is President)

- Belden & Blake develops unconventional gas sources (tight sands, Devonian/Antrim Shale, and coalbed methane)

Belden & Blake - From McKinley to Clinton

Late 1990s (Clinton is President)

- B&B spends about $100 million, drilling over 700 wells (1996-98)
- Adds 116 Bcf to proved developed reserve base
- About 75% of these newly discovered reserves (87 Bcf) would be classified as “unconventional” gas sources, as defined by DOE in 1970s

Belden & Blake - Doing Things Differently

The Role of Technology

- B&B uses current and emerging technologies, such as:
  - CO_2 to improve production (natural gas sand)
  - Production enhancements by deepening wellbore and replacing conventional lift methods (Antrim Shale)
  - Improved production methods (coalbed methane)

Belden & Blake - Doing Things Differently

Liquid CO_2 Remediation Example

Background/Problem:

- Wayne County (Ohio) well - Reached TD in Sept. 1995
- Jan. 1998 - Output plummets from 700 to 10 Mcfd in 30 days
- Suspected cause: Near-wellbore liquid blocking
- Cumulative prod. (through '98): 800 Mmcf/gas and 3,200 bbls/oil

Solution:

- Pumped 60 tons of liquid CO_2 to correct relative gas permeability
- Restored gas production rate to 500 Mcfd

Belden & Blake - Doing Things Differently

Norwood (Antrim) Example

- 32 wells deepened to expose the lower Norwood zone
- Total cost = $1,065,000 (Avg. cost per well = $33,000)
  - Avg. gas production increase per well = 107 Mcf/d
  - Avg. reserves added per well = 100 - 200 Mmcf

Results

- Added 5 Bcf to reserve base at a finding cost of $0.20/Mcf
- In 1999, B&B received GRI's "Pacesetters Award"

Belden & Blake - Doing Things Differently

Coalbed Methane Technology

- Geological areas
  - Defining coal measures
  - Computerized mapping systems
- Completion areas
  - Cased hole fracturing
  - Service company “alliance”
  - Sand control

Belden & Blake - Doing Things Differently

Coalbed Methane Technology

- Production and operations areas
  - Requires preplanning with state agencies
  - Establishes coalbed methane reserves and production in Pennsylvania
  - Expands along geologic trend with 80,000 acres under lease
  - Creates drilling opportunities for next 5 to 10 years

Belden & Blake - Establishing a Competitive Advantage

- 100 years from Belden Brick to Belden & Blake Oil & Gas demonstrates importance of technology
- Hydraulic fracturing - Important technology step for initial growth
- Recent growth from properties classified as “unconventional sources”
- Most new technology from programs supported by DOE and GRI
- Consider using other organizations for access to technology solutions

Petroleum Technology Transfer Council

PTTC's Low-cost Technology Programs Help Independents:

- Reduce costs
- Improve operating efficiency
- Increase ultimate recovery
- Add new oil and gas reserves
- Comply with environmental rules

Serving Independents' Needs

PTTC - "Technology Connections"

- Estimated 7,000 - 8,000 independent producers in U.S.
- Independents drill 85% of domestic wells, produce 65% of U.S. natural gas, and 40% of oil
- Independents produce 60% of oil output in lower 48 states
- For 1st half 1999, PTTC sponsored/cosponsored 64 workshops, with nearly total 3,000 attendees
- More than 10,000 industry contacts in 1998

Regional and National Focus

PTTC's 10 Regions Offer:

- Technology workshops
- Regional Resource Centers
- Websites/Newsletters

National Program Offers:

- CD-ROM Software Sampler - Published November 1998
- E&P Case Study Digest - Available September 1999
- National quarterly newsletter/Award-winning website

A Resource for Independents

PTTC
TECHNOLOGY CONNECTIONS
PETROLEUM TECHNOLOGY TRANSFER COUNCIL

A Resource for Independents

Primarily funded by the U.S. Department of Energy,

Office of Fossil Energy (NPTO,FETC)

PTTC is:

The independent producer's "Bridge to Solutions"

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